

A Visit to PacComm Packet Radio Systems

During a recent visit to the Tampa, Florida area, I was lucky enough to have some time available. I had always wanted to visit PacComm, located in Tampa. I called ahead to ask if a visit was okay, and spoke to the company's vice-president Linda Reedy, who graciously invited me to visit. PacComm was one of the pioneers of the "Packet Radio Revolution," and I thought that sharing some of my impressions from the visit would be interesting to the readers of this column.

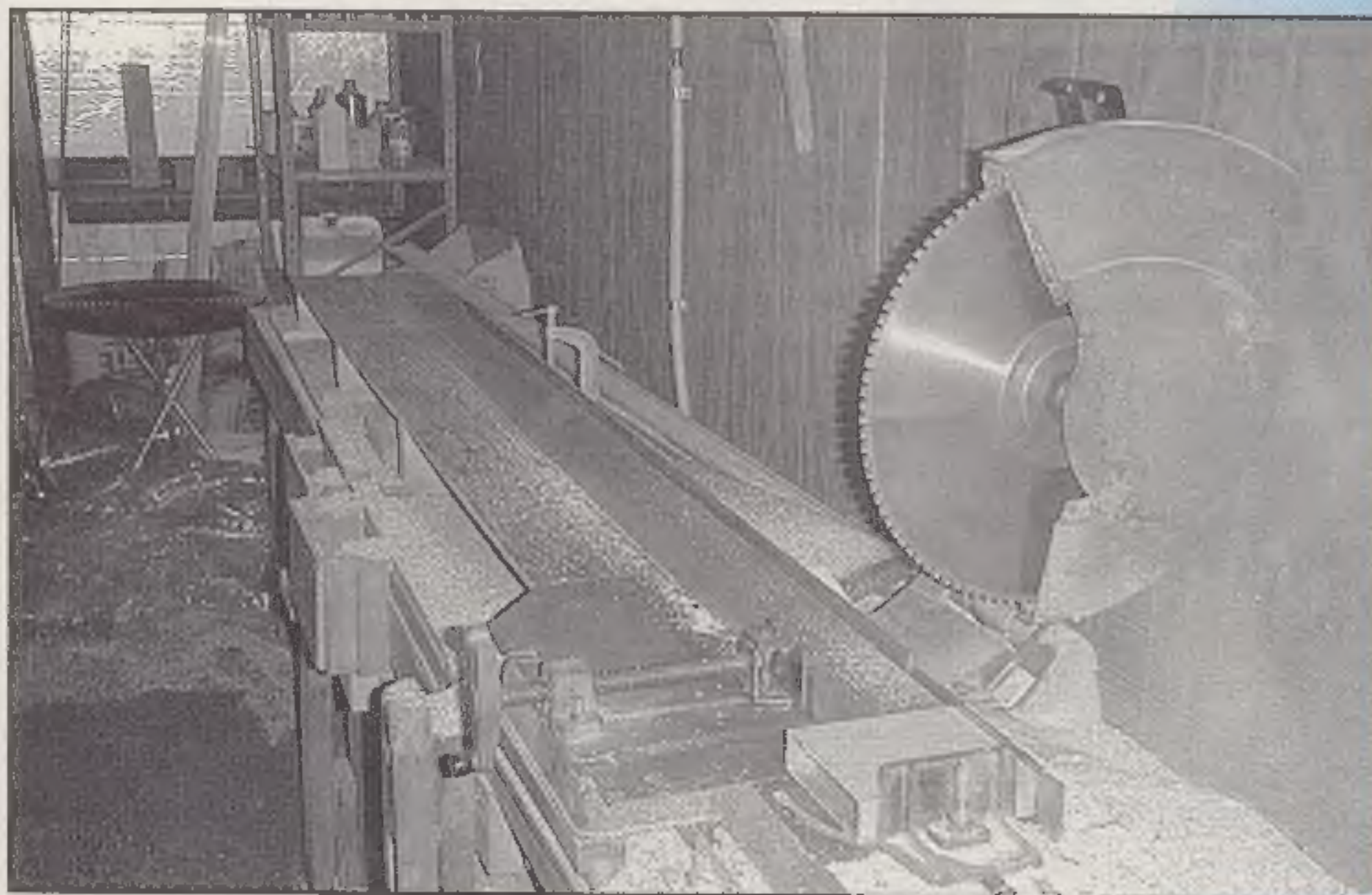
PacComm Packet Radio Systems is housed in a conventional-looking industrial building near the Tampa airport. The only indication of something unusual is the attached tower and antennas, the shattered main monopole antenna a mute testament to the fact that Florida gets a lot of lightning strikes.

Inside, it's immediately obvious that this is an interesting place for techies. For example, Linda's office houses PacComm's "museum"—a collection of examples of most of the equipment that PacComm has made over the years. Linda's personal favorite "museum piece" is the "Sprint" controller, which was PacComm's first "next generation" packet controller. Unfortunately for PacComm, Sprint (the telephone company) heard of PacComm's Sprint and threatened legal action for potentially infringing on Sprint's corporate name. PacComm promptly changed the name of the product to "Spirit," and the Spirit product line has been very successful for PacComm.

PacComm was founded by Gwyn Reedy, W1BEL, and his wife Linda in approximately 1984. The genesis of PacComm was Gwyn and Linda reselling TAPR TNC-2 kits out of their home and at hamfests, basically at cost. Gwyn had some ideas about derivatives of the TNC-2 and founded PacComm while he was still in the military service. Linda kept PacComm going through a rough first few years, with Gwyn unable to devote his full attention to it. As soon as Gwyn's military obligations were completed and he could turn his full attention to PacComm, the company



Alan Alfaro runs PacComm's service department.



PacComm's infamous chop saw, used for cutting extrusions to the proper length to make cabinets for many PacComm products.

began to thrive, producing the PacComm TNC-200 clone of the TNC-2. PacComm was one of the few to purchase a full source code license for the TNC-2 firmware, and the PacComm firmware base has been expanded and updated considerably.

PacComm's business is now approximately 75 percent commercial and 25 percent amateur radio. Much of the firm's revenue is derived from long-term contracts with customers that have very specialized requirements (quite often, military and municipal governments) to

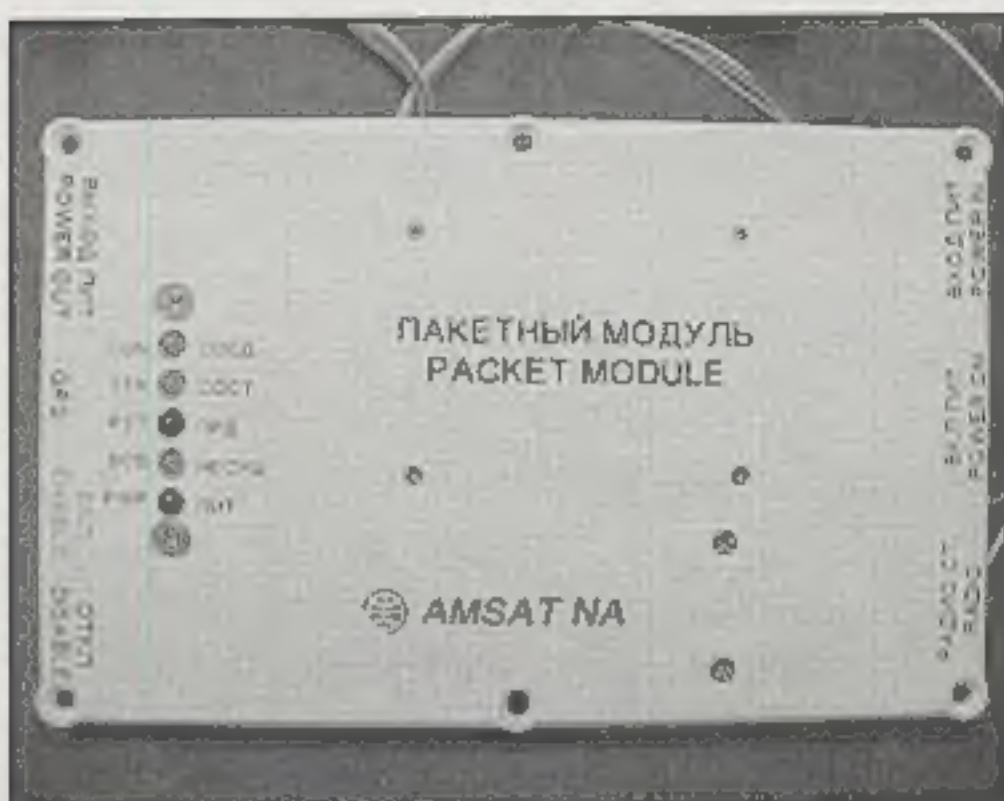
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Jim Weeks heads up PacComm's Engineering Department and handles computer-aided design, prototyping, and documentation.



Juan assembles circuit boards—many, many circuit boards.



PacComm-developed packet radio controller for use on the MIR space station. (Photo courtesy Jim Weeks)

interface two-way radio equipment with computers. Often the computer systems are highly specialized and firmware has to be modified to specifically match the specialized computer hardware. Other requirements are for highly miniaturized digital controllers. I was shown literally dozens of "variations on a theme" of what is basically a TNC. One of the most amusing units I was shown was a PacComm 9600 bps modem for a particular model of a two-way radio, which already *had* a built-in 9600 bps modem. It was explained that the built-in 9600 bps modem simply was not very good, and the PacComm 9600 baud modem worked much better, so the radio owner instructed PacComm to simply bypass the built-in modem and install their unit.

One of the most famous projects that PacComm has produced is the Packet Module made for use by the cosmonauts and astronauts aboard the MIR space station. A product line that is not



Some of the many older units in PacComm's "museum."

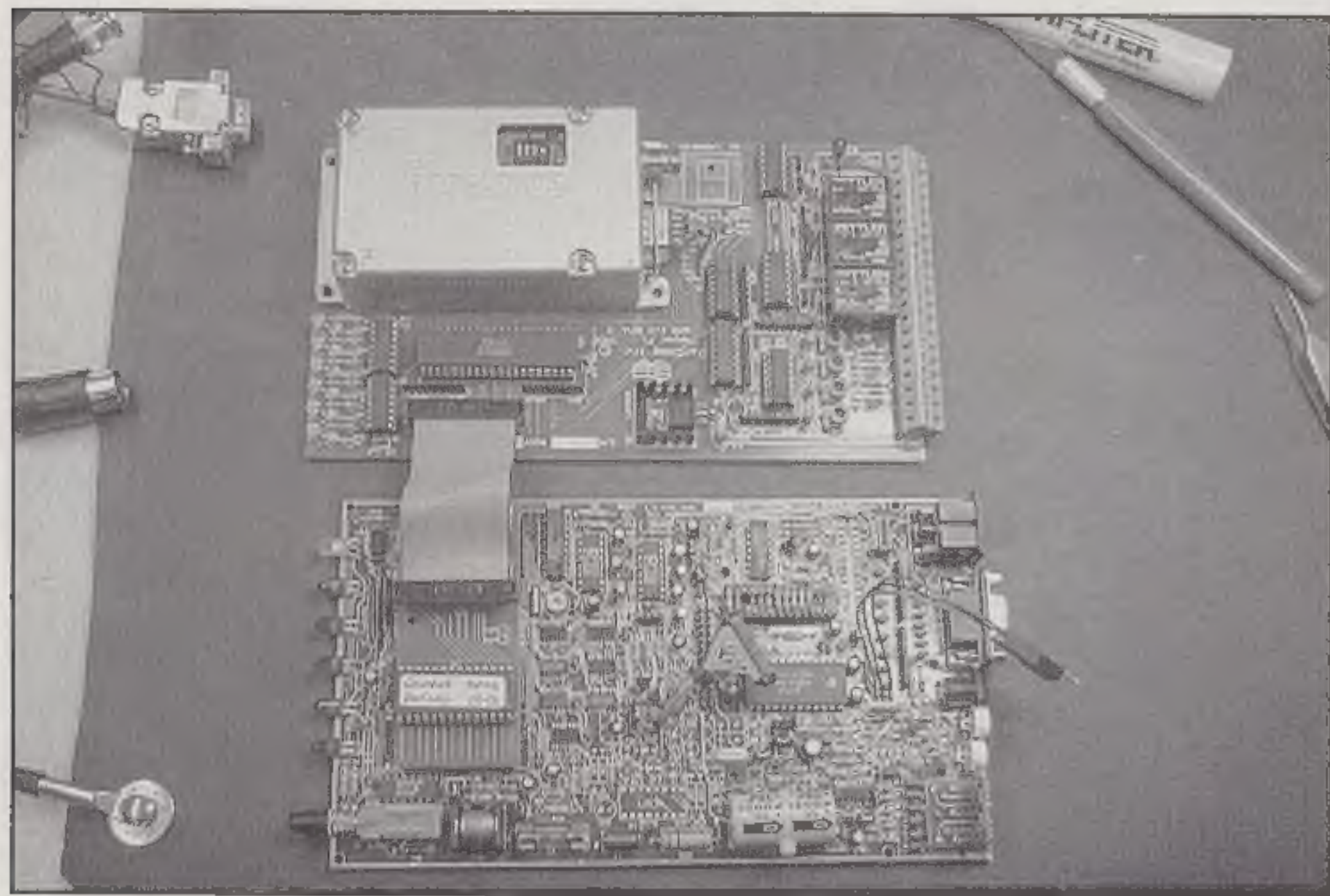
nearly so well known is PacComm's "Intelligent Border Marker System" that it developed for the US military for use in Bosnia. Basically, IBMS is a self-contained system—incorporating batteries, radios, GPS receiver, packet controller, and antenna assembly—that is dropped out of a helicopter, landing on an attached steel stake. More details on the IBMS are at <http://www.paccomm.com/paccomm1a.html>.

PacComm's niche in the wireless communications marketplace makes it clear that despite startling advances in wireless communications, much of it is based on TCP/IP and the pronuncia-

tions of "IP Everywhere" (of which I'm guilty), much of the work of wireless is still done with two-way radio technology, and IP for that application is overkill. For example, many of PacComm's projects involve integrating GPS technology into an existing radio system, but in a much simpler manner than Automatic Position Reporting System (APRS). The police department of one Latin American city needed to be able to see on a map the realtime position of their police cars, and wanted to try to "piggyback" that information on their existing, extensive two-way radio system. PacComm developed an internal packet controller



PacComm Packet Radio Systems, Tampa, Florida.



A typical packet controller with Maxon SD125 radio (case modified for easy access to the synthesizer control switches).

(such units are considerably more advanced; thus the label "TNC" isn't very accurate) that integrates a GPS receiver and the necessary modifications for the radio. PacComm trained the department's personnel to install the units, and now the police department has location capability at a small fraction of the cost of upgrading every radio.

Several years ago, when the amateur radio market took a downturn, PacComm made a hard choice to de-emphasize amateur radio sales in favor of commercial contacts. Realistically, selling TNCs at between \$100 and \$200

simply was not very lucrative, when the extensive marketing and support operations, and especially the personnel to staff them, were factored in. PacComm is still very much in the amateur radio market, but now relies on its web page (www.paccomm.com) and occasional catalog mailings to market to amateur radio operators.

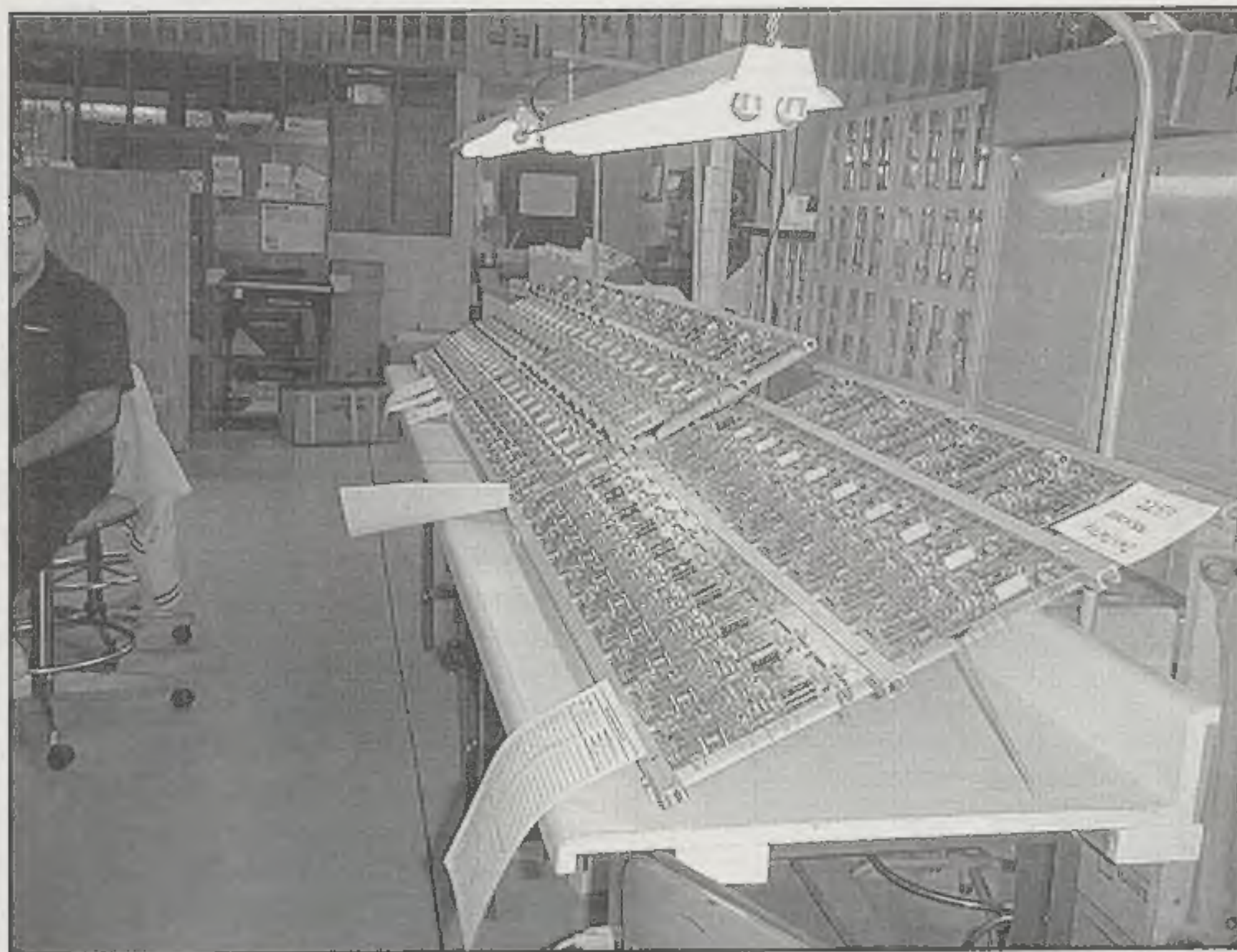
PacComm has a staff of approximately ten people. The number varies depending on whether a new project is being developed or a large order needs some extra help to be completed. One of the areas that was not cut back was

the service department, ably manned by Alan Alfaro. I was surprised to see that not only are PacComm products more than ten years old being serviced, but so are products for long-obsolete computers such as the Commodore VIC-20 and Commodore C-64.

PacComm does the vast majority of its production in-house, beginning from the printed-circuit board, and proceeding through circuit-board assembly, soldering, and final assembly. The firm's products are claimed to be 100% produced in the USA. Each unit produced is matched to a specific requirement by a specific customer, and each is a long-term contract, requiring PacComm to supply units as needed, provide repair services, and also to stock sufficient parts to be able to continue supplying units for a number of years. Much of PacComm's floor space is devoted to parts storage specifically to satisfy this requirement. One of the highlights of visiting PacComm's production facilities was seeing the infamous "chop saw," which is used to cut the extruded cabinets used in many of PacComm's products to the right length for each product. For example, enclosures for the Spirit product line and the TNC-200 are merely different-length cuts from a very long piece of extrusion.

It was surprising to me that PacComm's WA4DSY 56K modems are selling reasonably well, despite there being little domestic market for them. Linda explained that they are being used in overseas markets, mostly in commercial applications, with locally purchased transverters. To provide a computer I/O solution for the WA4DSY modem, PacComm developed a derivative of their Spirit packet controller called the "Spirit PAD," which is able to keep up with the throughput of the WA4DSY modem. Unfortunately, PacComm's deal to manufacture other next-generation packet radio/networking products under license from Gracilis simply didn't develop due to lack of communication and support from Gracilis. That was unfortunate, as the Gracilis PackeTen router likely could still find numerous applications, despite a design that is more than five years old.

PacComm is developing new products. It is considering re-introducing an old product line—the DR-200, which is a dual-port digipeater specifically designed for harsh environmental and RF conditions—to possibly begin intruding the concept of backbones into extensive APRS digipeater networks. The company is developing several products that incorporate spread-spectrum radios.



Long-term production runs at PacComm.

One of the most interesting "not quite a product" items that I saw during my visit was a Maxon SD125U radio. The SD125U is a small, relatively inexpensive data radio that covers amateur radio UHF frequencies, either 2 or 5 watts, and is synthesized. PacComm uses the SD125U, and the VHF version (SD125V, which unfortunately does not cover 144–148 MHz), in a number of its products, and has had very good experiences with them—after a few minor modifications, of course! I mentioned

that there well may be a reasonable market for such a radio, and if there is sufficient interest expressed to PacComm, they may offer it as a product.

All in all, my brief visit was a fascinating glimpse at PacComm's operations. I'd like to very much thank Linda Reedy for allowing CQ readers "a look around" at the birthplace of so much packet radio technology that we now take for granted.

73, Steve, N8GNJ



The WA4DSY 56K radio modem, which is popular overseas.

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